

What is claimed is:

1. An image processing apparatus that carries out image processing on M-level image data in accordance with image attribute, the image processing apparatus comprising:

a dot characteristic point extracting device that extracts dot characteristic points from the M-level image data;

a dot area identifying device that determines whether a target pixel belongs to a dot area based on the results of the extraction carried out by the dot characteristic point extracting device;

an N-level conversion unit that converts the M-level image data into N-level image data ( $M > N$ ); and

a parameter setting unit that sets the N-level conversion parameters used by the N-level conversion unit based on the results of the determination carried out by the dot area identifying device.

2. An image processing apparatus as claimed in Claim 1, further comprising:

an area identifying device that determines whether the target pixel belongs to a character area or a photograph area,

wherein the parameter setting unit specifies N-level conversion parameters in the N-level conversion unit based on the results of the determination carried out by the area identifying device and the results of the determination carried out by the dot area identifying device.

3. An image processing apparatus as claimed in Claim 2, wherein said area identifying device determines whether the target pixel belongs to a character area or a photograph

area based on the difference between the largest density value and the smallest density value in the area of a certain size including the target pixel.

4. An image processing apparatus as claimed in Claim 1, wherein said N-level conversion unit performs N-level conversion of M-level image data using the error diffusion method.

5. An image processing apparatus as claimed in Claim 4, wherein the N-level conversion parameters set by the parameter setting unit include an N-level conversion error gain adjustment value.

6. An image processing apparatus as claimed in Claim 4, wherein the N-level conversion parameters set by the parameter setting unit include an N-level conversion reference value.

7. An image processing apparatus as claimed in Claim 1, wherein said dot characteristic point extracting device extracts as dot characteristic points isolated points having a density difference of a specified minimum value from their surrounding pixels, and said dot area identifying device identifies a dot area by comparing with a specified threshold value the number of isolated points existing in an area of a specified size that includes the target pixel.

8. An image processing method for carrying out image processing on M-level image data in accordance with image attribute, the image processing method comprising the steps of:

extracting dot characteristic points from the M-level image data;

determining whether a target pixel belongs to a dot area based on the dot characteristic point extraction result;

setting N-level conversion parameters based on the dot area determination result; and

converting the M-level image data into N-level image data ( $M > N$ ) using the set N-level conversion parameters.

9. An image processing method as claimed in Claim 8, further comprising the step of:

determining whether the target pixel belongs to a character area or a photograph area,

wherein said N-level conversion parameters are set based on the results of the determination whether the target pixel belongs to a character area or a photograph area and the dot area determination result.

10. An image processing method as claimed in Claim 9, wherein said N-level conversion of M-level image data using the error diffusion method.

11. An image processing method as claimed in Claim 10, wherein the N-level conversion parameters include an N-level conversion error gain adjustment value.

12. An image processing apparatus as claimed in Claim 10,

wherein the N-level conversion parameters include an N-level conversion reference value.

13. An image forming apparatus comprising:
- a input unit that inputs M-level image data;
  - a dot characteristic point extracting device that extracts dot characteristic points from the M-level image data;
  - a dot area identifying device that determines whether a target pixel belongs to a dot area based on the results of the extraction carried out by the dot characteristic point extracting device;
  - an N-level conversion unit that converts the M-level image data into N-level image data ( $M > N$ );
  - a parameter setting unit that sets the N-level conversion parameters used by the N-level conversion unit based on the results of the determination carried out by the dot area identifying device; and
  - an output unit that outputs an image based on the N-level image data.